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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,538	01/23/2002	Tetsunori Kaji	520.35237VX3	4015

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EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/25/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/052,538

Applicant(s)

KAJI ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 14-18 and 23-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-18 and 23-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Art Unit: 1763

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Arai et al.

The rejection is maintained as stated in paper #<sup>4</sup>7 mailed on October 3, 2002 for the reasons of record.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai et al. (U.S. 6,110,287) in view of Ishida et al. (Japanese Patent Publication 05-234954).

Arai does not disclose a gap of 30 mm to 100 mm between the parallel electrodes.

Referring to the abstract, Ishida teaches that it is conventional in the art to have an electrode gap of 10 mm to 150 mm during etching to improve etching rate uniformity on the surface of a wafer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a gap of 30 mm to 100 mm between the electrodes in Arai's

Art Unit: 1763

apparatus during etching because it is conventionally known in the art and it improves etching rate uniformity.

5. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka et al. (U.S. 5,476,182) in view of Kofuji et al. (U.S. 6,231,777).

Referring to Figure 5, column 5, lines 14-45, and column 6, line 43-column 7, line 55, Ishizuka discloses a plasma processing apparatus, which includes: a section (10) for generating an upstream plasma and supplying radicals at a pressure of more than 100 mTorr to the processing chamber; means for supplying a second gas (66); means (70) for generating plasma at a pressure of 50 mTorr or less in the processing chamber; a bias supplying means (40) connected to the support table. The apparatus of Ishizuka has all of the claimed structures recited in claim 23 except an electrostatic attracting means. Kofuji teaches that it is conventional in the art to place an electrostatic chuck on the wafer holder in order to hold the wafer by electrostatic attracting force. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide an electrostatic chuck on the support table of Ishizuka because it is conventional to hold a wafer by electrostatic attracting force.

Kofuji also teaches to provide means for applying a pulse bias to the wafer in order to eliminate electron shading during plasma processing (col. 2, lines 13-28). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide Kofuji's system of applying a pulse bias in Ishizuka because this modification would eliminate electron shading during plasma processing.

***Response to Arguments***

6. Applicant's arguments filed 14-16 have been fully considered but they are not persuasive.

**Applicant has argued that Arai fails to teach a pulse bias applying means with high frequency.**

As seen in Figure 1 of Arai, the bias sources 21 and 22 are connected to the modulating device 23 (pulse) which is connected to the lower electrode 8, and the controller 25 controls the modulating device. Therefore Arai is capable of providing a pulse bias to the wafer W (col. 5, lines 24-35).

**Applicant has argued that Arai fails to teach a voltage suppression means.**

Arai clearly states that the modulating device 24 acts as the voltage suppression means by preventing charge up (col. 6, lines 41-46). In addition, the controller 25 is capable of shortening the period of the pulse bias voltage, thereby generating a voltage suppression means.

7. Applicant's arguments with respect to claims 17, 18, 23-27 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1763

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *WNL*  
April 18, 2003

*Alejandro*  
Luz L. Alejandro  
Primary Examiner  
Art Unit 1763